

# **FYDP Bank Investigation**

Thomas Dedinsky - VP Academic 'A' - Fall 2018



# Mandate



|                     |   |
|---------------------|---|
| <b>Motion:</b>      | Problem Posting Board   |
| <b>Mover:</b>       | TRON 19   |
| <b>Second:</b>      | ECE 20  |
| <b>Spirit:</b>      | To create a method for students to explore industry problems and connect with industry partners   |
| <b>Whereas:</b>     | Students have often worked with industry partners to complete their FYDPs and by doing so have helped the University gain stronger ties with industry |
| <b>And Whereas:</b> | There currently does not exist an easy way for students to find industry problems/partners for FYDP and other projects                                |
| <b>And Whereas:</b> | Non-Technical/Non-industry people currently do not have a way to propose good ideas to students   |
| <b>BIRT:</b>        | The VP Academic be mandated to explore the validity of this idea and the feasibility of its implementation  |
| <b>BIFRT:</b>       | The VP Academic presents their findings before the last meeting of Council this term (Fall 2018)  |
| <b>Result:</b>      | Motion Passed   |

# Explanation for Motion

*“It would be useful if Waterloo had a forum to post problems. As engineering students we’re technically minded, but we don’t know what problems exist. This could connect engineering students to the industry. Doctors might have an idea that needs to be worked on and students could help. There is a need to catalog useful and meaningful things to solve. No other university does this and it would be very helpful, maybe not for current fourth years, but definitely for first years.” [1]*

# Ideas Proposed



# Contact Industry for Assistance

- Have industry advisors for the projects, working in collaboration with the course instructors to make sure the scope is compatible with capstone course requirements
- Maybe ask for parts instead of whole project ideas
  - “A lot of times the project suggestions from industry people are a bit off-base. I think it's better to ask industry for "parts", whether that be actually parts, or tools, or something else.” [3]
- Connect with non-for-profits (Sana.MIT.edu) or grad students (UW School of Pharmacy)
- “There may also be an element of the faculty wanting companies to pay for this kind of access to students. I don't know where the line is for that kind of thing, but maybe something to ask them about so you don't undercut the sponsorship aspects of their existing programs.” [4]

# Industry Concerns

- Time demand for relationship mentorship-wise and project-wise could be too great for some companies
  - Are they expecting something like 2 hours per week for 4 months?
- Most likely wouldn't be related to current projects
  - Secrecy of current projects may limit relationship
  - Even recently completed projects can't share details "about the how"
  - Who owns the IP if it is recent?
- Past projects may be suitable if tweaked to create a new one
- Employers who submit should know when their problem is used
  - Maybe get progress and the final report

# Problem Bank Structure

- Look at existing resources to manage problem bank
  - Wiki
  - Stackoverflow/Piazza
  - Associated UW organization website
- Create a custom solution for problem bank
  - Capstone Project for SE 390 or ECE 498
- Work with a company to create this
  - Ripen (NOTE: Riipen and Ripen are different)
- Have a moderator for this problem bank
  - Possibly a knowledgeable full-time worker
- Possibility of it being non-industry crowdsourced?
  - Have students/professors search for ideas through connections (e.g. at other universities) and contribute to a public problem board



# Quality of Ideas

- Problems should be good and solution independent
  - “Otherwise you may accumulate problems like ‘The Ford company is looking for students to design a robot arm that can put pieces X and Y together quickly’.” [2]
- Solutions must not have incompatible time limits
  - Companies may be slow to respond on basic information or may want the project wrapped up prematurely if FYDP timelines’ aren’t clearly communicated
  - Companies may also expect more work from students than is realistic
- Make sure projects are open
  - Companies shouldn’t just get students to build them things, they should be doing significant design work (including problem definition) as part of the process

# Work With Companies Who Do This

- Riipen - <https://riipen.com/features/>
  - Looks like they partner with the industry to get relevant assignments and projects so that students can access the database and complete these tasks/connect with industry partners
  - Management Engineering uses this extensively
  - They post a call for projects and employers contact them and the problem statements are vetted before they're provided for students
- UW Blueprint - <https://www.facebook.com/uwblueprint/>
  - 6 groups within organization who accept projects based on what non-profits ask
  - Projects are more tailored for SE students, could be transferrable to FYDP
  - Well known so they don't really advertise

# Work With Companies Who Do This

- Mitacs - <https://www.mitacs.ca/en>
  - They offer research internships where students work under professors in various countries like Canada and Germany
  - Works with having Canadian students research internationally and with having international students research with Canadian professors
  - Professors can go to industry partners, say they want funding for the research and that they will hire research assistants (e.g. students)
  - Feasibility - 12 week spring term moroso designed for grad students, using Ontario OCE grants and NSERC CRDs
- Innocentive - <https://www.innocentive.com/ar/challenge/browse>
  - Offer cash prizes for people who solve large-scale problems
  - Timeline - Only one problem has a deadline that's not within the next three months

# Learn From Universities Who Do This

- Olin University - <http://www.olin.edu/research-impact/research/>
  - “Some of the research conducted at Olin is funded by external federal agencies such as the NSF and NIH, private foundations such as the Mellon Foundation and the Henry Luce Foundation, or through companies. Other research projects are funded through internal grants including the Olin College Faculty Development Program and the Student Activity Grants. Our Office for Corporate, Foundation and Sponsored Programs coordinates external funding of all research activities.”
- Drexel University - <https://drexel.edu/research-enterprise/discovery/institutes/>
  - “[Faculty, staff and students in Drexel Research Institutes] create new ideas, knowledge and approaches made possible by the unique combination of intellectual capital and research and innovation infrastructure they represent. [They] focus on multidisciplinary areas of science and engineering with important societal implications, a continuous flow of challenging scientific questions and opportunities, and unique intellectual and other assets at the University.”

# Preserve Current Backlog

- <https://uwaterloo.ca/capstone-design/node/3> is the current University backlog
  - Only has last three years of projects
  - Inconsistent formatting between programs
- [https://docs.google.com/document/d/172cvFiVO5xAygxRff5HHLEEZrO0aqq4YSIBjatF\\_eJM/edit](https://docs.google.com/document/d/172cvFiVO5xAygxRff5HHLEEZrO0aqq4YSIBjatF_eJM/edit) is the current archive, can be updated in the future
- May be useful to look into other archives such as OEC/CEC Innovation Design competitions which feature FYDP ideas
  - CEC 2019 Drive has past competitions which have Design Abstracts for each Innovation Design submission

# Contacts



# People I've Discussed This With

- Engineering Society Council - Fall 2018 Meeting #1
- Mechatronics Class of 2019
- Engineering Society Executive
- SE Capstone Head - Derek Rayside
- Larry Smith (through Chris Gavel, TRON 2019)
- CIVE Capstone Head - Marianna Polak
- ICCC Contact - Vanessa Schweizer
- Mitacs Contact - Mike McCleary
- Coop Working Group - October 2018
- MGMT Continuing Lecturer, Ada Hurst
- CHE Graduate Attributes Lecturer, Jason Grove
- SYDE Capstone Head, Matthew Borland
- Veeva Networks - Mark Vidov
- ByNorth - Caitlin Mulroney

# Resources I've Looked At

- <https://uwaterloo.ca/capstone-design/node/3>
- <https://uwaterloo.ca/problem-lab/problem-archive>
- <https://ece.uwaterloo.ca/~drayside/se-capstone-handbook.pdf>
- <https://www.mitacs.ca/en>
- <https://www.innocentive.com/>
- <https://ripen.com/engineering>
- <http://www.olin.edu/research-impact/research/>
- <https://drexel.edu/research-enterprise/discovery/institutes/>



**To Be Done**



# People To Contact In Future

- Employers
- UW Blueprint
  - <https://www.facebook.com/uwblueprint/>
  - <https://github.com/uwblueprint>
- Sana.MIT.edu
- Ben Graham/Larry Smith, Problem Lab
  - <https://uwaterloo.ca/problem-lab/problem-archive>
- Chris Renich, IDEAS Clinic
- Engineering Advancement people
  - <https://uwaterloo.ca/engineering/about/people/group/46>
- Global Entrepreneurship and Disruptive Innovation (GEDI)
  - <https://uwaterloo.ca/global-entrepreneurship-disruptive-innovation/>
- Oscar Nespoli, Former ME Capstone Head, Current Interdisciplinary Capstone Head
- Knowledge Integration Department, (interdisciplinary capstone projects)

# People To Contact In Future

- Mike McCleary, Mitacs
- Andrew Milne, First-Year MECH Head
- Ripen
  - <https://ripen.com/engineering>
- Mary Power, Centre for Teaching Excellence + Riipen (not Ripen)
- Velocity
- Olin University
  - <http://www.olin.edu/research-impact/research/>
- Drexel University
  - <https://drexel.edu/research-enterprise/discovery/institutes/>
- Office of Research
  - <https://uwaterloo.ca/research/>
- Colin G Ellard - Environmental Psych Professor (PSYCH 372)
- Jill P Tomasson Goodwin - User Experience Professor (DAC 309)

**The End**



# References

[1] <https://www.engsoc.uwaterloo.ca/wp-content/uploads/2018/10/CM-1.pdf>

[2] Problem Lab - Larry Smith (through Chris Gavel, TRON 2019),  
<https://mail.google.com/mail/u/0/#inbox/FMfcgxvzKtSDgbshKgksWzJqRbVvspTg>

[3] SE Capstone Head - Derek Rayside,  
<https://mail.google.com/mail/u/0/#inbox/KtbxLvHcKrKHqNZCQwSfjCDPKGGGRGSpsB>

[4] SYDE Capstone Head - Matthew Borland,  
<https://mail.google.com/mail/u/0/#inbox/KtbxLxGnPWsGsZpDPpSzcsPxXQDRCDfSxB>